

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF WISCONSIN**

BAD RIVER BAND OF THE LAKE  
SUPERIOR TRIBE OF CHIPPEWA INDIANS  
OF THE BAD RIVER RESERVATION

*Plaintiff,*

v.

ENBRIDGE ENERGY COMPANY, INC., and  
ENBRIDGE ENERGY, L.P.

*Defendants.*

ENBRIDGE ENERGY, L.P.

*Counter-Plaintiff,*

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v.

BAD RIVER BAND OF THE LAKE  
SUPERIOR TRIBE OF CHIPPEWA INDIANS  
OF THE BAD RIVER RESERVATION and  
NAOMI TILLISON, in her official capacity

*Counter-Defendants.*

Case No. 3:19-cv-00602

Judge William M. Conley Magistrate  
Judge Stephen Crocker

**DECLARATION OF HAMISH WEATHERLY IN SUPPORT OF ENBRIDGE’S  
OPPOSITION TO THE BAND’S REQUESTED PERMANENT INJUNCTION**

I, Hamish Weatherly, declare the following based on personal knowledge to which I am competent to testify:

1. I am currently a Principal Hydrologist at BGC Engineering Inc. (“BGC”) and have 25 years of industry experience in Canada, the United States, and South America working in water management and infrastructure design, river and creek hazard assessments, flooding, sedimentation, and environmental impacts. In a typical year, I am involved in over 100 detailed hydrotechnical investigations (DHIs) where oil and gas pipelines cross major rivers. These DHIs

are focused on estimating the likelihood of pipeline exposure and failure due to hydrotechnical processes (bank erosion, scour, and avulsion), and to provide a recommended action and associated timing.

2. BGC has been involved in monitoring the status of the Meander, including the five on-site cameras, during the snowmelt and associated flooding that occurred during the week of April 10, 2023. Enbridge has been providing me with Meander photographs, video, river flow rates, National Weather Service (NWS) river level probabilities, and other information for the high flow events that occurred the week of April 10 and following.

3. Based on my observations relying on the remote cameras at the Meander during the Spring, these cameras are an effective means for monitoring conditions at the Meander, specifically erosion, because even during flooding the loss of monuments can be observed and monitored in real time so that erosion, or any exposure or spanning, should it occur, would be observed.

4. Based on my knowledge, training, and experience, and all data and facts made available to me, it is my opinion that there is less than a 1% chance of erosion creating the critical span length calculated for this pipeline – an aerial span of 99 feet or more – before March 2024, even assuming no remediation is performed in the area.

5. In my Expert Report of January 31, 2022, I opined that prior to March 2023, the likelihood of Enbridge's pipeline being exposed to the flow of the Bad River at the Meander due to bank erosion or the development of a meander cutoff channel was low (<1% probability or 100-year return period). That opinion was based on:

- A minimum distance of 26.5 feet between the Meander and the Line 5 pipeline.
- Survey and streamflow data that allowed me to relate peak flow events of various return periods to measured bank erosion distances. For example, between November 2014 and May 2019, six floods resulted in 28 to 35 feet of erosion at the

critical minimum distance to the pipeline, including a greater than 500-year event in July 2016.

- Numerical bank erosion modelling completed by others.
- My professional judgement having worked on similar pipeline issues throughout North America.

6. Consistent with my January 31, 2022 opinion, Line 5 did not become exposed prior to March 2023, and continues not to be exposed.

7. I further noted that the timing of exposure is a function of the flood magnitudes that occur in the coming years, but the estimated average timeline of pipeline exposure from bank erosion was approximately 3-5 years from the date of the report.

8. Consistent with the above opinions, there has been further bank erosion at the Meander in April and May 2023. That erosion was caused by three separate flood events. Based on available streamflow data from United States Geological Survey (USGS) gage Bad River near Odanah, WI (#04027000), the Bad River peaked on: April 13 at 13,800 cfs (cubic feet per second); April 21 at 10,400 cfs; and May 1 at 10,800 cfs. The first flood has an approximate return period of 10 years, while the latter two floods have an approximate return period of 5 years. The peak flow events were in response to the melting of the annual snowpack and concomitant rainfall. It is my opinion that there is now a 5% to 10% chance of the pipeline becoming exposed before March 2024 assuming no remediation is performed in the area. This likelihood is for any exposure of the pipeline, not any spanning of the pipeline.

9. Based on measurements provided by Ian B. Paton of Wright Water Engineers, Inc. (WWE), Table 1 provides the approximate erosion that occurred at the D, M3, E, and F monument lines as a result of these three floods and the remaining setback distance from the top of bank.

**Table 1. Approximate bank erosion and remaining setback distance to Line 5 as of May 8, 2023.**

	Monument Lines			
	D-series	M3-series	E-series	F-series
Total Bank Loss (ft) (Spring 2023)	19.5	21.5	14.5	9
Distance from Top of Bank to Line 5 (ft) <sup>1</sup>	14.5	12.5	11	16.5

10. The observed erosion occurred immediately downstream of a natural log jam, which has limited erosion at the J and M2 monument lines. This log jam has shifted the focus of erosion to the monument lines listed in Table 1, rather than the J and M2 monument lines.

11. It is my understanding that a post-flood survey of the river and bankline has not yet been completed. The measurements provided in Table 1 are based on field observations by Mr. Paton of WWE with a tape measure and previous survey data.

12. The amount of erosion experienced at the Meander in 2023 over the course of these three flow events is not unusual. The magnitude of the erosion for those individual events is similar to that observed following individual floods that occurred in the period 2014-2022. During this period, five floods with magnitudes of 5 to 10 years and one flood with a return period >500 years occurred. What is unusual is that the observed sequence of floods in 2023 is without precedent in the flood record, with three distinct flood events occurring within an 18-day period.

13. Based on the information provided above and the potential for rainfall-induced floods events in the remainder of 2023, it is my opinion that there is a less than 1% chance of aerial spanning of 99 feet or more occurring before Spring 2024. This opinion is primarily because the recent erosion that has occurred at the Meander, and that likely could occur in the next year, does not fit the pattern of erosion that would cause such a span. The erosion that has occurred is concentrated in the D-F series. That area is approximately 40 feet wide. For a critical span length

of 99 feet to develop, the pipeline would need to become exposed over a broader area that roughly extends from the M2 to the B monument lines. At the M2 monument line, the distance from the top of bank to Line 5 is currently 23 feet based on measurements by Mr. Paton. Simply put, the erosion that has occurred and that could occur again along the same arc before March 2024 is not wide enough to cause a critical span of the pipeline.

14. It is thus my opinion based on my knowledge, training, and experience that there is not an “emergency” or “imminent threat” of a release at the Meander. However, flood monitoring, such as already occurring, remains a critical measure.

15. It remains my opinion that the various erosion prevention works proposed by Enbridge at the Meander would be effective in slowing down future erosion, particularly in the bank section where the erosion is focused, between the D-F series.

16. Enbridge has stated that it is willing to install erosion prevention work anywhere on the Meander such work is permitted by the Band, including anywhere on Enbridge’s property or on neighboring property. I note the general lack of bank erosion in the vicinity of the J-series monuments, where the bank appears to have been partially protected by the natural log jam.

17. I have been presented with an application package from Enbridge that I understand has been submitted to the Band, which entails installing sandbags along the bank of the Meander. This project proposes to install sandbags between the C and F monument lines and any other locations permitted by the Band. This project would be effective in preventing or slowing down future erosion. I recommend that the sandbags be extended between the M2 and B monument lines, to prevent potential future erosion from occurring in these locations, too.

18. I believe that the proposed sandbag project has less than a 1% likelihood of creating any unintended consequences because, among other things, the sandbags are simple to deploy,

conform to the contours of the bank, and, even if an accident occurred and sand spilled from a bag or bags, the area of the Meander is already sandy.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: May 15, 2023

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Hamish Weatherly